Release notes for ENDF/B Development n-072_Hf_181 evaluation

April 26, 2017

- `recent` Warnings:
  1. Fission widths given for non-fissile nucleus, but are zero
     0: Fission?

```
 Calculate Cross Sections from Resonance Parameters (RECENT 2015-1)
 ==========================================================================
 Retrieval Criteria----------        MAT
 File 2 Mimimum Cross Section- 1.0000E-10 (Standard Option)
 Reactions with No Background-     Output (Resonance Contribution)
... [526 more lines]
```

- `fudge-4.0` Warnings:
  1. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: total (Error # 0): CS Sum.

```
WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 0.54%
```

- `fudge-4.0` Errors:
  1. Calculated and tabulated Q values disagree.
     reaction label 13: n[multiplicity:'2'] + Hf180 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -5658741.6043396 eV vs -5694803. eV!
```

  2. The r(E) in Kalbach-Mann formulation is outside of allowed bounds
     reaction label 13: n[multiplicity:'2'] + Hf180 / Product: n / Distribution: / Kalbach-Mann - KalbachMann: (Error # 0): Kalbach goof

```
WARNING: Invalid 'r' in KalbachMann distribution at incident energy 2.e7 eV. Value=-7.090554e-05, should be in r
```

  3. Calculated and tabulated Q values disagree.
     reaction label 14: n[multiplicity:'3'] + Hf179 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -13046521.25018311 eV vs -13082580. eV!
```

  4. Calculated and tabulated Q values disagree.
     reaction label 15: n + H1 + Lu180 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -7979394.455352783 eV vs -8015456. eV!
```

  5. Calculated and tabulated Q values disagree.
     reaction label 16: n + H2 + Lu179 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -11447373.60070801 eV vs -11483430. eV!
```

  6. Calculated and tabulated Q values disagree.
     reaction label 17: Hf182 + gamma (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 6754057.886810303 eV vs 6717996. eV!
```

7. Calculated and tabulated Q values disagree.
   reaction label 18: n + He4 + Yb177 (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 1188477.933898926 eV vs 1152416. eV!
```

8. Calculated and tabulated Q values disagree.
   reaction label 19: H1 + Lu181_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -1853819.050994873 eV vs -1889881. eV!
```

9. Calculated and tabulated Q values disagree.
   reaction label 20: H2 + Lu180_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -5754828.354431152 eV vs -5790890. eV!
```

10. Calculated and tabulated Q values disagree.
    reaction label 21: H3 + Lu179_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -5190140.660064697 eV vs -5226202. eV!
```

11. Calculated and tabulated Q values disagree.
    reaction label 22: He3 + Yb179_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: -7819374.331939697 eV vs -7855436. eV!
```

12. Calculated and tabulated Q values disagree.
    reaction label 23: He4 + Yb178_s (Error # 0): Q mismatch

```
WARNING: Calculated and tabulated Q-values disagree: 7968876.886383057 eV vs 7932815. eV!
```

- `njoy2012` Warnings:

1. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (0): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 16 does not give recoil za= 72180
                         one-particle recoil approx. used.
```

2. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (1): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 17 does not give recoil za= 72179
                         one-particle recoil approx. used.
```

3. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (2): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 22 does not give recoil za= 72181
                         one-particle recoil approx. used.
```

4. Recoil is not given, so one-particle recoil approximation used.
   heatr...prompt kerma (3): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 28 does not give recoil za= 72181
                         one-particle recoil approx. used.
```

5. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (4): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 32 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

6. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (5): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 51 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

7. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (6): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 52 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

8. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (7): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 53 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

9. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (8): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 54 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

10. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (9): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 55 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

11. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (10): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 56 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

12. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (11): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 57 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

13. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (12): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 58 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

14. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (13): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 59 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

15. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (14): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 60 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

16. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (15): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 61 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

17. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (16): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt 91 does not give recoil za= 72181
                          one-particle recoil approx. used.
```

18. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (17): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt203 does not give recoil za= 71181
                          one-particle recoil approx. used.
```

19. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (18): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt204 does not give recoil za= 71180
                          one-particle recoil approx. used.
```

20. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (19): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt205 does not give recoil za= 71179
                          one-particle recoil approx. used.
```

21. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (20): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt206 does not give recoil za= 70179
                          one-particle recoil approx. used.
```

22. Recoil is not given, so one-particle recoil approximation used.
heatr...prompt kerma (21): HEATR/hinit (4)

```
 ---message from hinit---mf6, mt207 does not give recoil za= 70178
                          one-particle recoil approx. used.
```

23. There is bad Kalbach parameter (r(E) or otherwise)
check...ace consistency check (0): ACER/check energy distributions (0)

```
 check energy distributions
   consis: bad kalbach r for (n,2n)at  2.000000E+01 -> 2.000000E-01
```